

THE SPECIES OF *AUTOMATE* (CARIDEA: ALPHEIDAE) IN THE EASTERN PACIFIC OCEAN

Mary K. Wicksten

Abstract.—Two species of alpheid shrimp, genus *Automate*, occur in the eastern Pacific Ocean. *Automate rugosa* Coutière has been found in the Gulf of Panama and off western Mexico. A detailed description and the first illustrations of this species are provided. *Automate dolichognatha* De Man has been collected at Isla Clarion, off Panama, Colombia, Ecuador, and the Galápagos Islands. *Automate haightae* Boone is a junior synonym of *A. dolichognatha*.

Introduction

Two species of *Automate* have been recorded from the Pacific coast of central America. *Automate rugosa*, from the Gulf of Panama, was described in a few sentences without an illustration (Coutière 1900). De Man (1911) provided more details on the species. In 1931, L. Boone described *A. haightae* from the Islas Perlas, Panama, which is synonymized herein with *A. dolichognatha* De Man, not reported previously from the area.

Specimens of *Automate* spp. were found in the collections of the Allan Hancock Foundation, University of Southern California, and the U.S. National Museum of Natural History. The type of *A. haightae* was borrowed from the American Museum of Natural History for comparison with specimens from other areas.

This work was supported in part by a research fellowship of the Allan Hancock Foundation and a short-term visiting fellowship of the Smithsonian Institution. Frances Runyan, Los Angeles County Museum of Natural History, prepared the drawings.

Automate dolichognatha De Man

Automate dolichognatha De Man, 1887:529-532, pl. 22, fig. 5.—De Man, 1911:139.—Banner and Banner, 1973:299-303, fig. 1.

Automate gardineri Coutière, 1902:337.—Chace, 1972:74.

Automate sp.—De Man, 1911:140, fig. 2.

Automate haightae Boone, 1931:184-187, fig. 22.

Automate johnsoni Chace, 1955:13-16, fig. 7.

See Banner and Banner 1973, for a more complete synonymy.

Type-locality.—Noordwachter Island, Indian Archipelago (Pulau Tuguan, Indonesia).

Recorded range.—Djibouti; Eylath, Israel; Maldive and Laccadive Archipelagoes; Malaysia; Japan; Marianas Islands; as far east as Samoa in the central Pacific (Banner and Banner 1973); North Carolina; Virgin Islands; Antigua Island; Barbados and Yucatan Peninsula (Chace 1972); North shore, Isla Tabogilla, Islas Perlas, Bahía de Panamá (Boone 1931).

Material examined.—Isla Clarion, Mexico (18°20'N, 114°44'W), shore, 27 March 1954, L. Pinkas and D. Joseph, 1 specimen. North shore, Isla Tabogilla, Islas Perlas, Panama (about 9°N, 79°W), holotype of *A. haightae*. Islas Secas, Panama (7°57'N, 82°01'25"W), shore, rock and reef, 4 Feb. 1935, R.V. *Velero III* sta. 446-35, 1 specimen. Wafer Bay, Isla Cocos (5°32'45"N, 87°00'10"W), shore, rock, 1 March 1933, *Velero III* sta. 105-33, 3 specimens. Port Utria, Colombia (5°59'10"N, 77°21'20"W), shore, rock, 23 Jan. 1935, *Velero III* sta. 413-35, 1 specimen. Bahía Cabita, Cabo Corrientes, Colombia (5°29'20"N, 77°29'35"W), shore, sand near stream, 13 Feb. 1934, *Velero III* sta. 229-34, 1 specimen. Isla Gorgona, Colombia (2°58'N, 78°11'15"W), shore, rock and sand, 22 Jan. 1935, *Velero III* sta. 405-35, 1 specimen. Isla Solanga, Ecuador (1°35'10"S, 80°51'55"W), 39 m, mud sample, 18 Jan. 1935, no station number, 1 specimen. Gardner Bay, Hood Island (Isla Española), Galápagos (1°23'05"S, 89°39'40"W), 18 m, rock and nullipores, 24 Jan. 1933, *Velero III* sta. 25-33, 1 specimen. Academy Bay, Indefatigable Island (Isla Santa Cruz), Galápagos (0°45'13"S, 90°20'28"W), shore, rock, 3 Feb. 1933, *Velero III* sta. 49-33, 1 specimen.

Color in life.—"Pale translucent gallstone yellow to nearly clear, fingers of chelae dull white, eggs cadmium orange" (Waldo L. Schmitt, unpubl. field notes). "Semi-translucent, creamy yellow" (Boone 1931).

Remarks.—I have compared the type of *A. haightae* and its description carefully to other specimens from the eastern Pacific as well as to the descriptions of *A. dolichognatha* given by De Man (1877), and Banner and Banner (1973). *Automate haightae* falls well within the limits of variation of *A. dolichognatha*. Boone failed to compare her specimen with any other species of *Automate* except *A. evermanni* Rathbun. The current synonymy of *A. haightae* with *A. dolichognatha* extends the range of this species across the Indo-West Pacific region into the eastern Pacific.

Automate rugosa Coutière

Figs. 1, 2

Automate rugosa Coutière, 1900:357.—De Man, 1911:140.

Type-locality.—Gulf of Panama.

Description.—Anterior margin of carapace deeply recessed posterior to eyes, with very low median lobe. Carapace inflated, smooth and unarmed, anterolateral angles rounded.

Pleuron of first abdominal somite with slightly convex margin, anterior

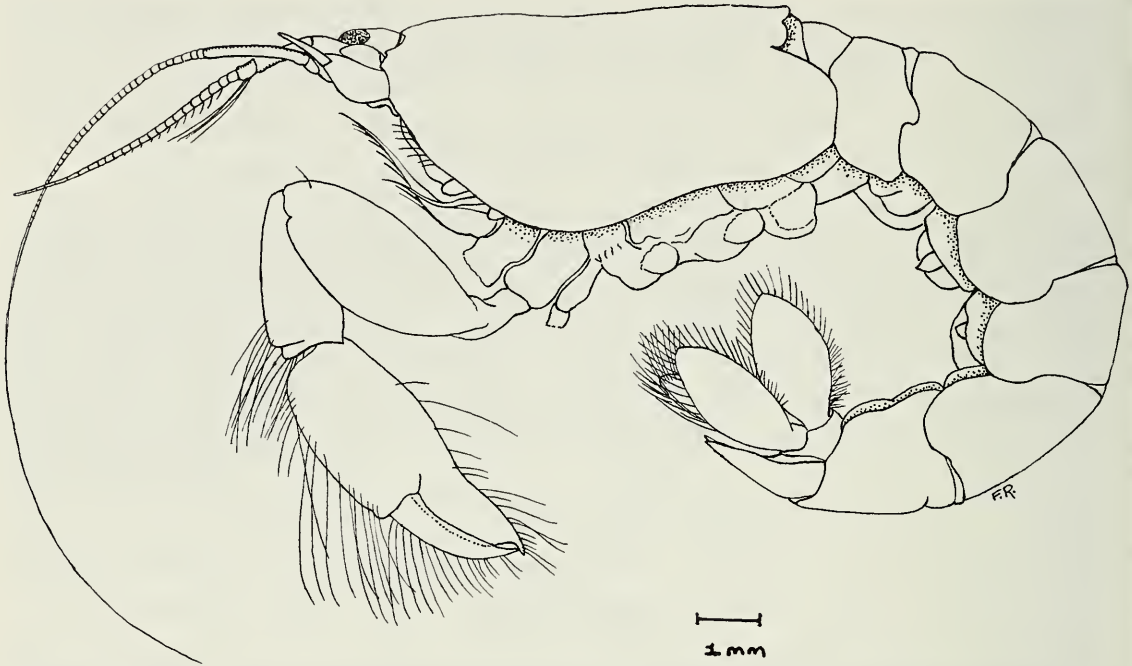


Fig. 1. *Automate rugosa*, female, total length 22.5 mm. South Bay, Isla Cedros, Mexico. Velero IV station 1703-49.

and posterior angles rounded. Pleura of second to fifth somites with sinuous margins and rounded angles. Sixth segment $1-1.3\times$ as long as fifth, posterolateral angle directed posteriorly. Telson laterally constricted near base and converging to narrow posterior margin; dorsal surface unarmed; posterior margin transverse, without median projection, armed with pair of small lateral spines and pair of much longer, slender mesial spines.

Antennular peduncle with stylocerite broadly convex mesially, nearly straight laterally, short apical tooth not reaching end of basal antennular segment. Mesial surface of basal segment without ventral tooth. Second segment $1.3\times$ as long as first and $3\times$ as long as third. Lateral flagellum thickened almost to distal end.

Antennal peduncle longer than antennular peduncle. Antennal scale reaching more than $0.5\times$ length of antennal peduncle, lateral margin straight, distal tooth short and stout, overreaching blade. Basal segment of peduncle without tooth at articulation with scale.

Mandible with 5 marginal teeth on incisor process, distal segment of palp broad. First maxilla with bilobed palp, proximal lobe slender, with tuft of setae; distal lobe larger, bearing fringe of teeth. Second maxilla with palp, scaphognathite, and bilobed endite. First maxilliped with broad, 3-jointed palp. Second maxilliped with elongate lobe at base of epipod. Third maxilliped exceeding antennal peduncle by length of its terminal segment. Ter-

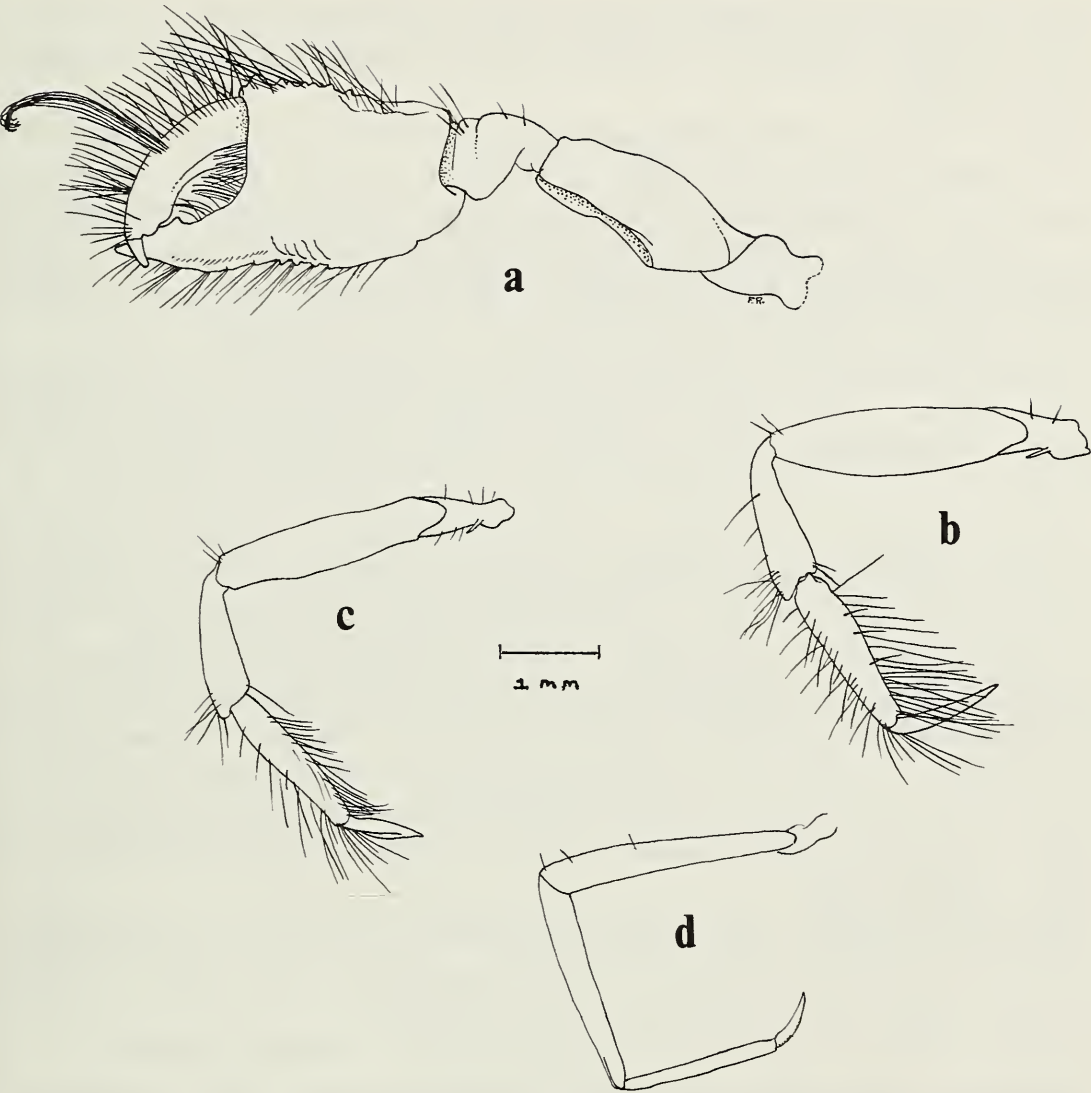


Fig. 2. *Automate rugosa*: a, Major chela; b, Third pereopod; c, Fourth pereopod; d, Fifth pereopod.

minal segment heavily setose. Penultimate segment greater than $0.5\times$ length of terminal segment, setose, Antepenultimate segment slightly less than length of terminal segment, with rounded dorsal margin.

First pereopods very unequal. Major cheliped overreaching antennal peduncle by length of chela. Fingers shorter than palm, gaping. Movable finger armed with blunt proximal teeth on opposable margin. Tuft of long setae may be present on outer margin of movable finger. Fixed finger with blunt tooth at point of contact with movable finger. Patch of pile at proximal margin of gape of fingers. Palm about as long as broad, with rounded tubercles at distal margins. 5 slight ridges just proximal to base of fixed finger.

Carpus less than $0.5 \times$ length of palm. Merus subequal to palm, dorsal and ventral margins sinuous or rounded. Ischium about $0.5 \times$ length of merus, without spines.

Minor cheliped overreaching antennal peduncle by more than length of chela. Fingers shorter than palm. Low tooth on fixed finger at point of contact with movable finger. Patch of setae on fixed finger, filling much of gape of fingers. Crest bearing long setae along dorsal margin of palm, ending distally in 3 low teeth. Carpus slightly longer than palm. Merus shorter than palm, margins rounded. Ischium about $0.3 \times$ length of merus.

Second pereopod overreaching antennal peduncle by entire carpus and chela. Fingers about equal to palm. Carpus 5-jointed, ratio of articles 3:10:4:3:4. Merus $0.8 \times$ length of carpus. Ischium slightly shorter than merus.

Third pereopod overreaching antennal peduncle by dactyl and most of propodus. Dactyl slender, simple, about $0.6 \times$ length of propodus. Propodus without spines. Carpus about equal to propodus. Merus about $1.5 \times$ length of propodus. Ischium with spine. Fourth pereopod with spatulate dactyl, about $0.5 \times$ length of propodus. Propodus with slender marginal setae. Carpus about equal to propodus. Merus $1.5 \times$ length of carpus. Ischium about $0.3 \times$ length of merus, with spine. Fifth pereopod with slender dactyl, about $0.4 \times$ length of propodus. Propodus without spines. Carpus long, about $1.4 \times$ length of propodus. Merus about equal to carpus. Ischium $0.2 \times$ length of merus, without spine.

Material examined.—Off Turtle Bay, Mexico ($27^{\circ}39'05''\text{N}$, $114^{\circ}54'47''\text{W}$ – $27^{\circ}39'12''\text{N}$, $114^{\circ}54'12''\text{W}$), 33–57 m, sand and mud, 18 Jan. 1940, 1 broken specimen. South Bay, Isla Cedros, Mexico ($28^{\circ}05'\text{N}$, $115^{\circ}21'\text{W}$), 30 m, sand and mud, 5 March 1949, *Velero IV* sta. 1703-49, 2 broken specimens.

Remarks.—Despite the lack of illustrations, *A. rugosa* can be recognized by its brief description. Coutière (1900) remarked on the crests of the cheliped, a noticeable feature in the material examined. De Man (1911) in his key to the species of *Automate* mentioned the following features of *A. rugosa*: carpocerite not longer than antennular peduncle, proportion between length and height of the large chela in the female less than 2, the palm being just as long as high, upper and lower margin of the palm very rugose, and second legs as in *A. evermanni* (second carpal segment of second legs 3 or 4 times as long as the first). In my specimens, the carpocerite slightly exceeds the antennular peduncle, but the material otherwise agrees with the notes given by Coutière and De Man.

In lacking spines on the flexor margin of the propodus of the third and fourth pereopods, *A. rugosa* agrees with *A. anacanthopus* De Man, *A. evermanni* Rathbun, and *A. rectifrons* Chace. Like *A. anacanthopus* and *A. evermanni*, it has a small rostrum. The peculiar tuberculate chela with the ridges is quite unlike that of any other species of *Automate*.

The two records of *A. rugosa* suggest that it is strictly a subtidal species, unlike *A. dolichognatha*.

Literature Cited

- Banner, D. M., and A. H. Banner. 1973. The alpheid shrimp of Australia. Part 1: The lower genera.—Records of the Australian Museum 28(15):291–382.
- Boone, L. 1931. A collection of anomuran and macruran Crustacea from the Bay of Panama and the fresh waters of the Canal Zone.—Bulletin of the American Museum of Natural History 63:137–189.
- Chace, F. A., Jr. 1955. Notes on shrimps from the Marshall Islands.—Proceedings of the United States National Museum 105(3349):1–22.
- . 1972. The shrimps of the Smithsonian-Bredin Caribbean Expeditions with a summary of the West Indian shallow-water species (Crustacea: Decapoda: Natantia).—Smithsonian Contributions to Zoology 98:179 pp.
- Coutière, H. 1900. Sur quelques Alpheidæ des côtes Américaines (collection de l'U.S. National Museum, Washington).—Comptes Rendus Hebdomadaires des Séances de l'Académie des Sciences, Paris, 1900:356–358.
- . 1902. Sur quelques espèces nouvelles de genre *Automate* De Man.—Bulletin du Muséum National d'Histoire Naturelle, Paris 9:337–342.
- Man, J. G. De. 1887. Bericht über die von Herrn Dr. J. Brock im indischen Archipel gesammelten Decapoden und Stomatopoden.—Archiv für Naturgeschichte 53(1):215–600, pls. 7–22a.
- . 1911. The Decapoda of the Siboga Expedition. Part II. Family Alpheidæ.—Siboga Expeditie 39a¹:1–465.

Department of Biology, Texas A&M University, College Station, Texas 77843.